

CLAIMS

What is claimed is:

1. An ink-jet printhead comprising:
 - a substrate;
 - a first insulating layer on the surface of the substrate;
 - first and second conductors on the first insulating layer separated from each other;
 - a heater including a plurality of conductor connection layers electrically connecting the first and second conductors to each other, and between the first and second conductors;
 - a second insulating layer between the first and second conductors and between the plurality of conductor connection layers;
 - a barrier wall on the substrate and defining an ink chamber with ink to be ejected; and
 - a nozzle plate on the barrier wall, forming upper walls of the ink chamber and in which nozzles through which ink filled in the ink chamber is ejected are formed.
2. The printhead of claim 1, further comprising an interface in at least one of the first and second connection portions connecting each of the first and second conductors connected to the conductor connection layers.
3. The printhead of claim 1, wherein the conductor connection layers extend from one of the first and second conductors.
4. The printhead of claim 1, wherein the conductor connection layers are formed of Ti, TiN, Ta, or TaN.
5. The printhead of claim 1, further comprising a passivation layer on an entire surface of the substrate covering the first and second conductors.
6. The printhead of claim 5, further comprising an anti-cavitation layer on the passivation layer.
7. The printhead according to claim 1, wherein the resistance required for the heater is substantially the total resistance of the conductor connection layers.

8. The printhead according to claim 1, wherein a number of the plurality of conductor connection layers varies with the resistance required for the heater.

9. A method for manufacturing an ink-jet printhead, the method comprising:
forming a first insulating layer on a surface of a substrate;
forming a first conductor on the first insulating layer;
forming a second insulating layer on the first insulating layer and the first conductor;
patterning the second insulating layer, and forming a plurality of via holes through which the first conductor is exposed;
forming a plurality of conductor connection layers and a second conductor on the via holes and the second insulating layer;
forming a passivation layer on an entire surface of the substrate to cover the first and second conductors;
forming an anti-cavitation layer on the passivation layer;
forming a barrier wall defining an ink chamber, on the substrate; and
forming a nozzle plate, in which nozzles are formed, on the barrier wall.

10. The method of claim 9, wherein the forming the plurality of conductor connection layers and the second conductor on the via holes and the second insulating layer comprises:
depositing a predetermined metallic material on the via holes and the second insulating layer,
patterning the predetermined metallic material, and
forming, substantially simultaneously, the plurality of conductor connection layers and the second conductor.

11. The method of claim 9, wherein the forming the plurality of conductor connection layers and the second conductor on the via holes and the second insulating layer comprises:
depositing a predetermined material on the via holes,
dry etching the predetermined material,
forming the plurality of conductor connection layers, and
forming the second conductor on the second insulating layer and the conductor connection layers.

12. The method of claim 9, wherein the predetermined material is one of Ti, TiN, Ta, or TaN.

13. An ink-jet printhead, comprising:
a substrate;
a plurality of conductors positioned on the substrate; and
a plurality of connection layers connecting at least one of the conductors to another conductor,
wherein the connected conductors form a heater such that an additional resistance material need not be provided.

14. The ink-jet printhead according to claim 13, further comprising a plurality of insulating layers,
wherein a first one of the insulating layers separates the substrate from one of the conductors and serves as an adiabatic layer preventing heat generated in the heater from conducting toward the substrate and a second one of the insulating layers separates one of the conductors from another of the conductors.

15. The ink-jet printhead according to claim 13, wherein the connection layers are made of a barrier metal.

16. A method for manufacturing an ink-jet printhead, the method comprising:
forming a plurality of alternating insulating layers and conductors on a surface of a substrate;
patterning at least one of the insulating layers forming via holes and exposing at least one of the conductors; and
connecting at least one of the conductors to another conductor,
wherein the connected conductors form a heater such that an additional resistance material need not be provided and one of the insulating layers serves as an adiabatic layer preventing heat generated in the heater from conducting toward the substrate.

17. The method according to claim 16, further comprising:
forming a passivation layer covering the conductors;
forming an anti-cavitation layer on the passivation layer; and
forming a nozzle plate and barrier wall, defining an ink chamber, on the substrate.
18. The method of claim 16, wherein the connecting at least one of the conductors to another conductor, comprises:
depositing a predetermined metallic material on the via holes and the patterned insulating layer,
patterning the predetermined metallic material, and
forming another conductor.
19. The method of claim 16, wherein the connecting at least one of the conductors to another conductor, comprises:
depositing a barrier metal on the via holes,
dry etching the barrier metal,
forming the plurality of conductor connection layers, and
forming another conductor.